BROOKHAVEN NATIONAL LABORATORY

Work Permit # _____
Work Order # _____
Job# _____ **Activity#** _____

1. Work requester fills out this section. ☐ **Standing Work Permit**

Requester: Don Lynch	Date: 02/06/2008	Ext.: 2253	Dept/Div/Group: PO/PHENIX
Other Contact person (if different from requester): Carter Biggs			Ext.: 7515
Work Control Coordinator: Don Lynch		Start Date: 02/13/2008	Est. End Date: 03/17/2008
Brief Description of Work: Enter MMN to perform installation of MuTrigger FEE prototype			
Building: 1008	Room: IR	Equipment: MuTrgr FEE proto	Service Provider: PHENIX technicians and MuTrgr FEE Experts

2. WCC, Requester/Designee, Service Provider, and ESS&H (as necessary) fill out this section or attach analysis

ESS&H ANALYSIS

Radiation Concerns ☒ None ☐ Activation ☐ Airborne ☒ Contamination ☐ Radiation ☐ Other

☐ Special nuclear materials involved, notify Isotope Special Materials Group ☐ Fissionable materials involved, notify Laboratory Criticality Officer

Radiation Generating Devices: ☐ Radiography ☐ Moisture Density Gauges ☐ Soil Density Gauges ☐ X-ray Equipment

Safety and Security Concerns	☐ None	☐ Explosives	☐ Transport of Haz/Rad Material	
☐ Adding/Removing Walls or Roofs	☐ Critical Lift	☐ Fumes/Mist/Dust*	☐ Magnetic Fields*	☐ Pressurized Systems
☐ Asbestos*	☐ Cryogenic	☐ Heat/Cold Stress	☐ Nanomaterials/particles*	☐ Railroad Work
☐ Beryllium*	☐ Electrical	☐ Hydraulic	☐ Noise*	☐ Rigging
☐ Biohazard*	☐ Elevated Work	☐ Lasers*	☐ Non-ionizing Radiation*	☐ Security Concerns
☐ Chemicals/Corrosives*	☐ Excavation	☐ Lead*	☐ Oxygen Deficiency*	☐ Suspect/Counterfeit Items
☒ Confined Space*	☐ Ergonomics*	☐ Material Handling	☐ Penetrating Fire Walls	☐ Vacuum
* Industrial Hygiene (IH) Review Required				☐ Other

Environmental Concerns	☒ None	☐ Work impacts Environmental Permit No.	
☐ Atmospheric Discharges (rad/non-rad)	☐ Land Use Institutional Controls	☐ Soil Activation/contamination	☐ Waste-Mixed
☐ Chemical or Rad Material Storage or Use	☐ Liquid Discharges	☐ Waste-Clean	☐ Waste-Radioactive
☐ Cesspools (UIC)	☐ Oil/PCB Management	☐ Waste-Hazardous	☐ Waste-Regulated Medical
☐ High water/power consumption	☐ Spill potential	☐ Waste-Industrial	☐ Underground Duct/Piping
Waste disposition by:			☐ Other
Pollution Prevention (P2)/Waste Minimization Opportunity:	☒ No ☐ Yes		

FACILITY CONCERNS	☒ **None**		
☐ Access/Egress Limitations	☐ Electrical Noise	☐ Potential to Cause a False Alarm	☐ Vibrations
	☐ Impacts Facility Use Agreement	☐ Temperature Change	☐ Other
☐ Configuration Control	☐ Maintenance Work on Ventilation Systems	☐ Utility Interruptions	

WORK CONTROLS

Work Practices

☐ None	☐ Exhaust Ventilation	☒ Lockout/Tagout	☐ Spill Containment	☐ Security (see Instruction Sheet)
☒ Back-up Person/Watch	☐ HP Coverage	☐ Posting/Warning Signs	☐ Time Limitation	☐ Other
☐ Barricades	☐ IH Survey	☐ Scaffolding-requires inspection	☐ Warning Alarm (i.e. "high level")	

Personal Protective Equipment

☐ None	☐ Ear Plugs	☐ Gloves	☐ Lab Coat	☐ Safety Glasses	
☐ Coveralls	☐ Ear Muffs	☐ Goggles	☐ Respirator*	☐ Safety Harness	
☐ Disposable Clothing	☐ Face Shield	☐ Hard Hat	☐ Shoe Covers	☐ Safety Shoes	☐ Other

Permits Required (Permits must be valid when job is scheduled.)

☐ None	☐ Cutting/Welding	☐ Impair Fire Protection Systems
☐ Concrete/Masonry Penetration	☐ Digging/Core Drilling	☐ Rad Work Permit-RWP No
☐ Confined Space Entry	☐ Electrical Working Hot	☐ Other

Dosimetry/Monitoring

☐ None	☐ Heat Stress Monitor	☐ Real Time Monitor	☐ TLD
☐ Air Effluent	☐ Noise Survey/Dosimeter	☐ Self-reading Pencil Dosimeter	☐ Waste Characterization
☐ Ground Water	☐ O_2/Combustible Gas	☐ Self-reading Digital Dosimeter	☒ Other Check O2 level prio to entry
☐ Liquid Effluent	☐ Passive Vapor Monitor	☐ Sorbent Tube/Filter Pump	

Training Requirements (List specific training requirements)

Confined Space, CA-Colider User, PHENIX Awareness

Based on analysis above, the Walkdown Team determines the risk, complexity, and coordination ratings below:				**If using the permit when all hazard ratings are low, only the following need to sign: (Although allowed, there is no need to use back of form)**	
ESS&H Risk Level:	☐ Low	☒ Moderate	☐ High	WCC:	Date:
Complexity Level:	☒ Low	☐ Moderate	☐ High	Service Provider:	Date:
Work Coordination:	☒ Low	☐ Moderate	☐ High	Authorization to start	Date:
				(Departmental Sup/WCC/Designee)	

3. Both work requester and service provider contribute to work plan (use attachments for detailed plans)

Work Plan (procedures, timing, equipment, and personnel availability need to be addressed): See attached procedure and
Special Working Conditions Required (e.g., Industrial Hygiene hold points or other monitoring) None
Notifications to operations and Operational Limits Requirements: None
Post Work Testing, Notification or Documentation Required: No

Job Safety Analysis Required: ☐ Yes ☒ No	Walkdown Completed (Required): ☐ Yes

Reviewed by: Primary Reviewer signature means that the hazards and risks that could impact ESS&H have been identified, a Walkdown was completed and the hazards will be controlled according to BNL requirements.

Title	Name (print)	Signature	Life #	Date
Primary Reviewer				
ES&H Professional				
Building Manager				
Service Provider				
Work Control Coordinator	Don Lynch		20146	
Other				
	Review Done: ☐ in series	☐ team		

4. Job site personnel fill out this section.

Note: Signature indicates personnel performing work have read and understand the hazards and permit requirements (including any attachments).			
Job Supervisor:		Contractor Supervisor:	
Workers:	Life#:	Workers :	Life#:
Workers are encouraged to provide feedback on ESS&H concerns or on ideas for improved job work flow. Use feedback form or space below.			

5. Department/Division Line Manager or Designee

Conditions are appropriate to start work: (Permit has been reviewed, work controls are in place and site is ready for job.)			
Name:	Signature:	Life#:	Date:

6. Worker provides feedback.

Worker Feedback (use attached sheets as necessary)

a) WCM/WCC: Are there any changes as a result of worker feedback? ☐ Yes ☐ No

Note: See work planning and control subject area section 2.6.

7. Post Job Review/Closeout: Work Control Coordinator (authorizing dept.) checks quality of completed permit and ensures the work site is left in an acceptable condition. (WCC can delegate clean up of work area to work supervisor.) The WCC ensures that the change process to update drawings, placards, postings, procedures, etc. are initiated , if necessary.

Name:	Signature:	Life#:	Date:
Comments:			

Work plan Attachment **WP# _____**

MMN Entry During Run for MuTrigger FEE Prototype II Test Insytallation

INTRODUCTION

A second prototype for the PHENIX Muon Trigger FEE upgrade has been assembled based on improvements over the original prototype tested in the summer of 2007. PHENIX experts intend to test the new prototype in it' intended operational location, inside the Muon North magnet (MMN). The installation is scheduled for Feb 27, and it is intended to test that day, then leave the prototype in for the remainder of run 8 for further tests. A preliminary walkdown of the install location on Feb 13th during the maintenance access day prior to the installation day is also planned.

MMN MuTr FEE TS&R (Troubleshoot and Repair)

The following operations will take place during a **restricted access** period for designated for experimental access to the PHENIX IR. It is estimated that the entire procedure will take less than 8 hours.

1. Prior to any IR entry, all PHENIX magnets will be ramped down and locked out.

2. Prior to entry into the MMN C-A safety shall be contacted, when he arrives to sample the internal MMN atmosphere, the sliding access panel shall be opened to permit sampling and an O2 content of the MMN internal atmosphere shall be sampled and recorded on the attached sheet.

3. The C-A confined space safety expert shall determine from the tests whether it is safe to enter the MMN for the purposes stated herein. ***In no event shall anyone enter the MMN prior to approval of the C-A confined space monitoring expert.***

4. After clearance to enter has been, properly trained MuTrigger FEE experts and/or properly trained PHENIX technicians shall sign the entry log sheet (attached) and may then enter and perform installation and operational checks.

5. During the task HV to the MuTr detector panels may turned on and off to trouble shoot faults and test quality of the installation. Current/voltage limits on MuTr chassis are within allowable working limits and/or properly shielded from personnel contact and do not require any additional permits.

6. After completion of the tasks all equipment brought into the MMN shall be removed, the MMN access panel closed, and the MMN lockout removed.

7. There will be multiple accesses to accomplish this work: (1) 2/13 walkdown, and evaluation, (2) 2/27 installation, (3) ~3/17 removal. There may be additional short accesses to do interim troubleshooting. Each of these accesses shall require repeat of steps 1 thru 6.

BROOKHAVEN NATIONAL LABORATORY

CONFINED SPACE ENTRY CERTIFICATION

Location Building 1008, IR, Muon Magnet North (MMN)		Date
Department PO	Division PHENIX	
Building 1008	Area/Location/Room: IR, MMN	
Supervisor/Designee Don Lynch/J. Carter Biggs		Life # 20146/15639

PRE-ENTRY QUESTIONS ***For each item, check "yes" or "no": If no, consult Supervisor***	**YES**	**NO**
Is entry essential to perform work?	□	□
Have all personnel been trained in confined space entry?	□	□
Are conditions safe to remove utility-hole cover?	□	□
Has opening been guarded?	□	□
Is monitoring equipment calibrated?	□	□
Has monitoring been performed and recorded below?	□	□
Is GFCI used, if outside or in wet conditions?	□	□
Is ventilation blown into bottom of space? (If required)	□	□
Are personnel instructed to evacuate upon hazard detection?	□	□
Have all workers reviewed these entry requirements?	□	□
Radiation: If present, RWP may be required – review work with ESH Coordinator and RCD personnel. Evaluate hazards and controls.	□ **Reviewed**	□

SPACE CLASSIFICATION QUESTIONS For each item, check box only if "yes"	Class 2A	Class 2B	Class 2C
Engulfment Hazard Present			□
Entrapment Hazard Present			□
Electrical Systems:			
• Deenergized	**X**		
• Energized and Working Hot			□
• Energized, but Guarded or not Working Hot	□		
Mechanical Systems:	n/a		
• Deenergized	□		
• Energized and Working Hot			□
• Energized but Guarded or not Working Hot	□		
Other Energized Systems: (e.g., steam, sewage)	n/a		
• Deenergized	□		
• Energized and Working Hot			□
• Energized but Guarded or not Working Hot	□		
Chemical Hazards inherent in space, based upon monitoring, but controllable by Ventilating - ***Monitor for O_2 prior to entry***	X	□	
Chemical Hazards inherent in space, based upon monitoring, but not controllable by ventilating	n/a		□
Chemical Sources, introduced into space? (e.g., welding fumes, solvents)	n/a		□
High Temperature/Pressure Hazard? (other than steam utility-holes)	n/a		□

- If ANY box in column 2C is checked, a Confined Space Permit **IS** required.
- If any box in column 2B is checked, and none in column 2C, a Confined Space Permit **IS NOT** required **BUT** continuous monitoring and ventilating ARE required.
- If only boxes in column 2A are checked, no additional requirements apply.

Classification evaluation

CLASSIFICATION	I have completed the front and back of this Confined Space Entry Certification form and classified this space. If the confined space is classified as a 2C, I will obtain a Confined Space entry permit. If the space is Class 2B, continuous monitoring and ventilation is required and will be documented on this form.	
CLASS: 2A	Supervisor/Designee: Life #	Date:

BNL CONFINED SPACE ENTRY CERTIFICATION

Meter:	Serial #	Calibration Date:
Day of Use Sensor Check □ Yes □ No		
Tested By:		BNL#:

MONITORING RESULTS					
Tested By:		BNL Number:			
Date/ Time	Oxygen % (% O2)	Flammable Gas (% LEL)	Carbon Monoxide (CO ppm)	Hydrogen Sulfide (H2S ppm)	Other:
Pre-Entry Certification test					
Acceptable Reading	19.5 – 23.5 %	< 10 % of LEL	<25 ppm	<10 ppm	

Supplemental sampling record

CLASS 2B CONFINED SPACE ENTRY CERTIFICATION

For Class2B spaces, continuous monitoring is required.

MONITORING RESULTS					
Tested By:		BNL Number:			
Date/ Time	Oxygen % (% O2)	Flammable Gas (% LEL)	Carbon Monoxide (CO ppm)	Hydrogen Sulfide (H2S ppm)	Other:
Acceptable Reading	19.5 – 23.5 %	< 10 % of LEL	25 ppm	10 ppm	

Class 2B: Describe Method of Ventilation:

Muon Magnet Confined Space Entry Certification Sheet

*The undersigned certify that they have taken the BNL Confined Space Training, BNL Course # **HP-OSH-016**, within the last twenty four months, and understand the hazards involved in working in the south and north muon magnets (**MMS and MMN).***

DATE	SIGNATURE	LIFE/GUEST #